**Warren County School District**

**PLANNED INSTRUCTION**

**COURSE DESCRIPTION**

**Course Title:** Advanced Chemistry (Honors)

**Course Number:** 00333

**Course Prerequisites:** Successful Completion of Academic Chemistry or permission of the principal

**Course Description:**

Advanced Chemistry provides able and motivated students with the opportunity to pursue college-level chemistry studies while still in high school. This rigorous preparatory course is designed for students who will study chemistry or a related field at the college level. Advanced Chemistry is a one-year, one-credit honors course. Topics include: crystallography, ideal gases, nuclear chemistry, thermodynamics, quantum mechanics, bonding and coordination chemistry, as well as career exploration within the field of chemistry.

**Suggested Grade Level:** Grades 11-12

|  |  |  |  |
| --- | --- | --- | --- |
| **Length of Course:** | One Semester | Two Semesters | Other (Describe) |

**Units of Credit:** 1 (Insert ***None*** if appropriate)

**PDE *Certification and Staffing Policies and Guidelines* (CSPG) Required Teacher Certifications**:

CSPG 34 Chemistry

**Certification verified by WCSD Human Resources Department**:  Yes  No

**TEXTBOOK AND SUPPLEMENTAL MATERIALS**

**Continue using Board approved textbook?** Yes  No (*If yes, then complete the information below.*)

**Board Approved Textbooks, Software, Supplemental Materials:**

**Title: Chemistry: The Central Science 14th Edition**

**Publisher: Pearson**

**ISBN #: 978-0134414232**

**Copyright Date: 2018**

**Date of WCSD Board Approval:** Click or tap to enter a date.

**BOARD APPROVAL:**

**Date Written:** \_\_3/17/2018 \_\_

**Date Approved:** Click or tap to enter a date.

**Implementation Date:** 2018-2019

**SPECIAL EDUCATION AND GIFTED REQUIREMENTS**

The teacher shall make appropriate modification to instruction and assessment based on a student’s Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

**COURSE OVERVIEW**

(*List the content to be taught*)

A. Gases

1. Avogadro’s Hypothesis

2. Molar volume

3. Ideal Gas Law

4. Gas reaction Stoichiometry

B. Limiting reactants

C. Solids

1. Crystal systems

2. Unit cells

3. Closest packing

4. Semiconductors

5. Liquid crystals

6. Amorphous substances

7. Hydrates

D. Nuclear chemistry

1. Types of radiation

3. Elementary particles

4. Quark theory

5. Balancing nuclear equations

6. Decay and half-life

7. Nuclear reactions

a. Fission

b. Fusion

E. Thermodynamics

1. Enthalpy

2. Entropy

3. Free energy

F. Oxidation-reduction

1. Oxidation

2. Reduction

3. Balancing Redox equations

G. Electrochemistry

1. Electrolytic conduction

2. Metallic conduction

3. Electrolysis

4. Voltaic cells

5. Nernst equation

H. Quantum-mechanical model of the atom

1. Bohr atom

2. De Broglie’s Hypothesis

3. Heisenberg Uncertainty Principle

4. Schrodinger’s Wave Equation

5. Quantum numbers

6. Pauli Exclusion Principle

I. Molecular structure

1. VSEPR

2. Atomic orbital overlap

3. Hybridization

4. Resonance

5. Molecular orbitals

J. Coordination Chemistry

1. Nomenclature

2. Coordinate covalent bonds

3. Ligand Field Theory

K. Laboratory Time: Throughout course

Academic Standards

**3.1 Unifying Themes**

12B Apply concepts of models as a method to predict and understand science and

technology.

12C Assess and apply patterns in science and technology.

**3.2 Inquiry and Design**

12B Evaluate experimental information for appropriateness and adherence to relevant

science processes.

12C Apply the elements of scientific inquiry to solve multi-step problems.

**3.4 Physical Sciences, Chemistry and Physics**

12A Apply concepts about the structure and properties of matter.

12B Apply and analyze energy sources and conversions and their relationship to heat and

temperature.

**4.3 Environmental Health**

12A Analyze the complexity of environmental health issues.

12B Analyze the local, regional and national impacts of environmental health.

**Common Core Standards:**

CC.3.5.11-12 Reading Informational Text

CC.3.6.11-12 Writing

**ASSESSMENT**

**Portfolio Assessment:** Yes No

**District-Wide Common Final Examination Required:** Yes No

**Course Challenge Assessment** (Describe)**:** Must score a minimum of an 80% on the final exam.

**WRITING TEAM:** Warren County School District Teachers

**WCSD STUDENT DATA SYSTEM INFORMATION**

1. Is there a required final examination? Yes No

***\*Warren County School District Policy 9741 and9744 state, “All classes in grades 9-12 shall have a final exam.”***

1. Does this course issue a mark/grade for the report card? Yes No
2. Does this course issue a Pass/Fail mark? Yes  No
3. Is the course mark/grade part of the GPA calculation?  Yes No
4. Is the course eligible for Honor Roll calculation?  Yes  No
5. What is the academic weight of the course?

|  |  |  |
| --- | --- | --- |
| No weight/Non credit | Standard weight | Enhanced weight |
|  |  |  |